Fig.1

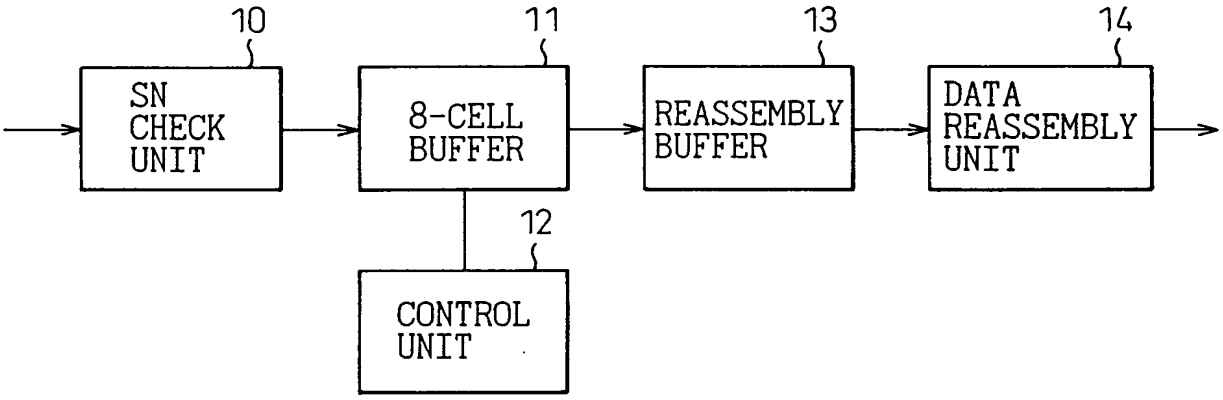

10
SN CHECK UNIT
11
8-CELL BUFFER
12
CONTROL UNIT
13
REASSEMBLY BUFFER
14
DATA REASSEMBLY UNIT

Fig.2

a: SC	0	1	2	3	4	5	6	7
b: RECEIVED CSI	0	0	0	0	0	0	0	0
c: DECISION FORMAT	N	N	N	N	N	N	P	N

(1) CONTROL METHOD OF 8 CELL BUFFER

a: SC	0	1	2	3	4	5	6	7
b: RECEIVED CSI	0	0	0	0	0	0	0	0
d: DUMMY CELL	0	0	1	1	1	0	0	0
c: DECISION FORMAT	N	N	N	N	P	N	N	N

(2) CONTROL METHOD OF 8 CELL BUFFER

a: SC	0	1	2	3	4	5	6	7
b: RECEIVED CSI	0	0	0	0	0	0	0	0
e: INVALID CELL	0	0	1	0	1	0	0	0
c: DECISION FORMAT	N	N	N	N	P	N	N	N

(3) CONTROL METHOD OF 8 CELL BUFFER

EP 0 715 476 A2

Fig.3

a: SC	0	1	2	3	4	5	6	7
b: RECEIVED CSI	0	0	0	0	0	0	0	0
d: DUMMY CELL	0	0	0	0	1	0	0	0
e: INVALID CELL	0	0	1	0	0	0	0	0
c: DECISION FORMAT	N	N	N	N	P	N	N	N

(4) CONTROL METHOD OF 8 CELL BUFFER

a: SC	0	1	2	3	4	5	6	7
b: RECEIVED CSI	0	0	0	0	1	1	0	0
c: DECISION FORMAT	N	N	N	N	P	N	N	N

(5) CONTROL METHOD OF 8 CELL BUFFER

a: SC	0	1	2	3	4	5	6	7
b: RECEIVED CSI	0	0	1	0	1	0	0	0
c: DECISION FORMAT	N	N	N	N	P	N	N	N

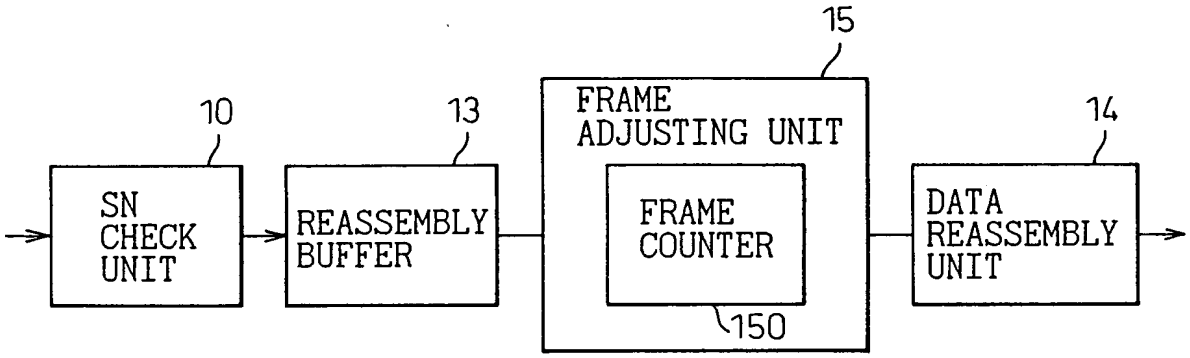
(6) CONTROL METHOD OF 8 CELL BUFFER

a: SC	0	1	2	3	4	5	6	7
b: RECEIVED CSI	0	0	1	0	1	0	0	0
e: INVALID CELL	0	0	1	0	0	0	0	0
c: DECISION FORMAT	N	N	N	N	P	N	N	N

(7) CONTROL METHOD OF 8 CELL BUFFER

EP 0 745 296 A2

Fig.4



FOREIGN 5470350

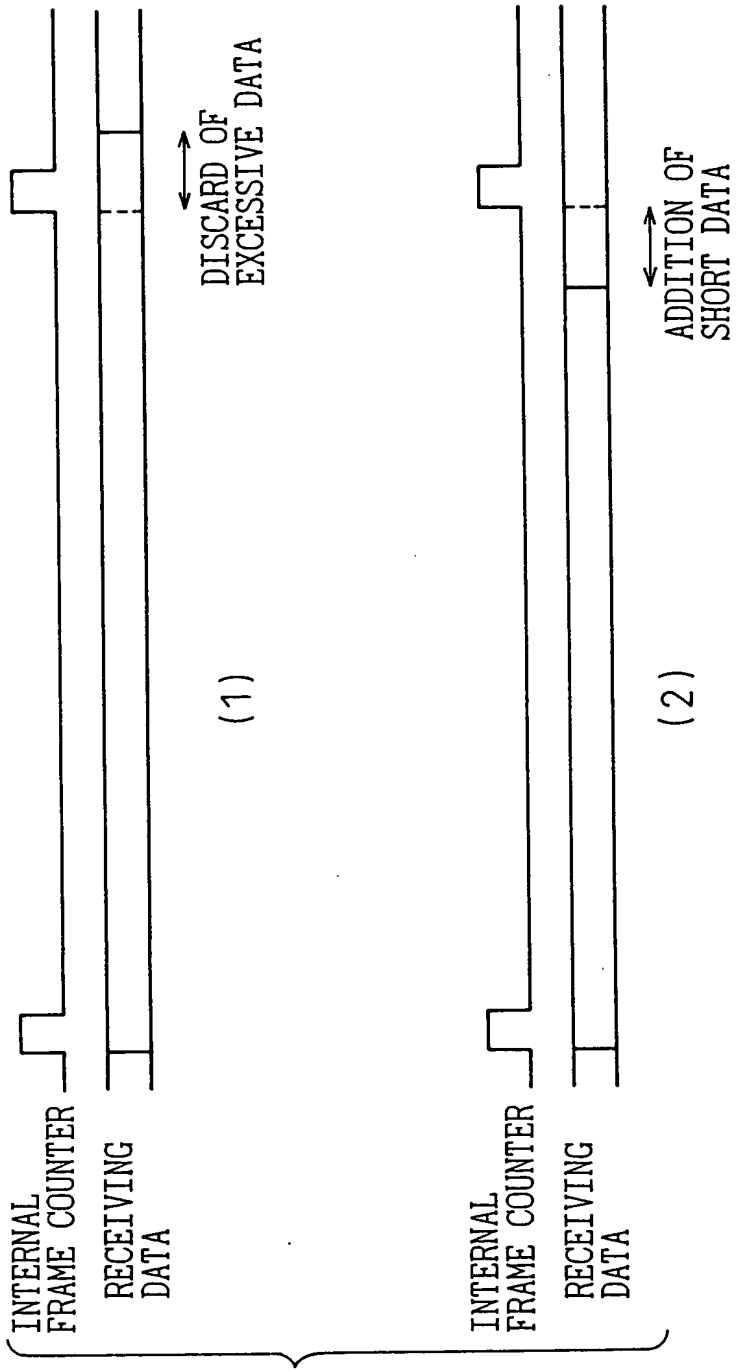

INTERNAL FRAME COUNTER
RECEIVING DATA
DISCARD OF EXCESSIVE DATA
(1)
INTERNAL FRAME COUNTER
RECEIVING DATA
ADDITION OF SHORT DATA
(2)

Fig.5

Fig.6

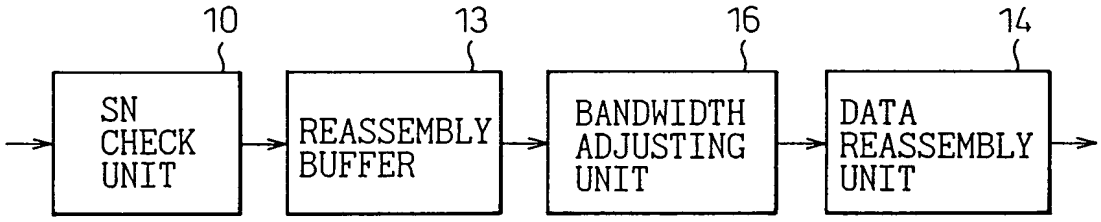

10
13
16
14
SN CHECK UNIT
REASSEMBLY BUFFER
BANDWIDTH ADJUSTING UNIT
DATA REASSEMBLY UNIT

Fig.7

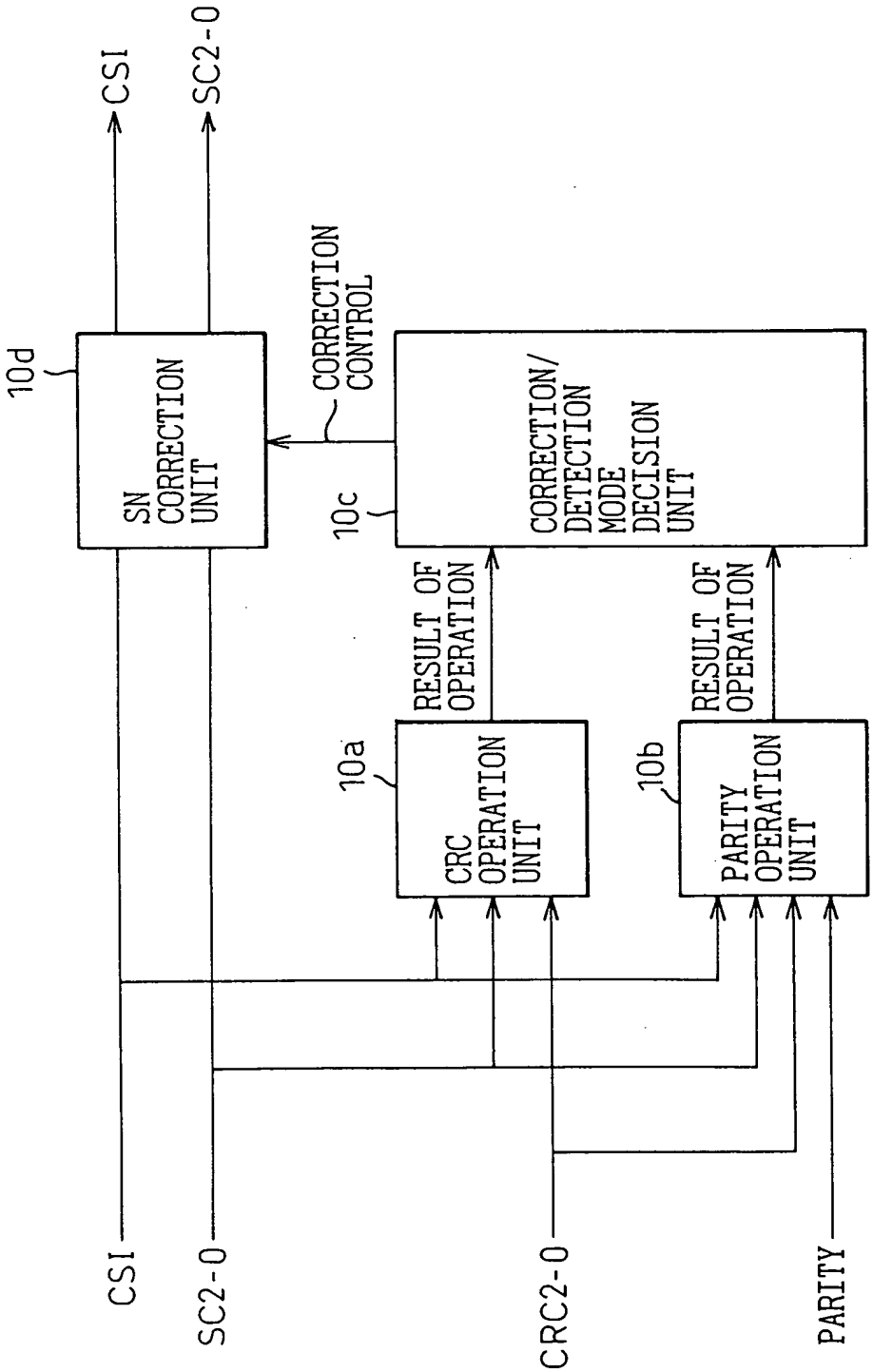
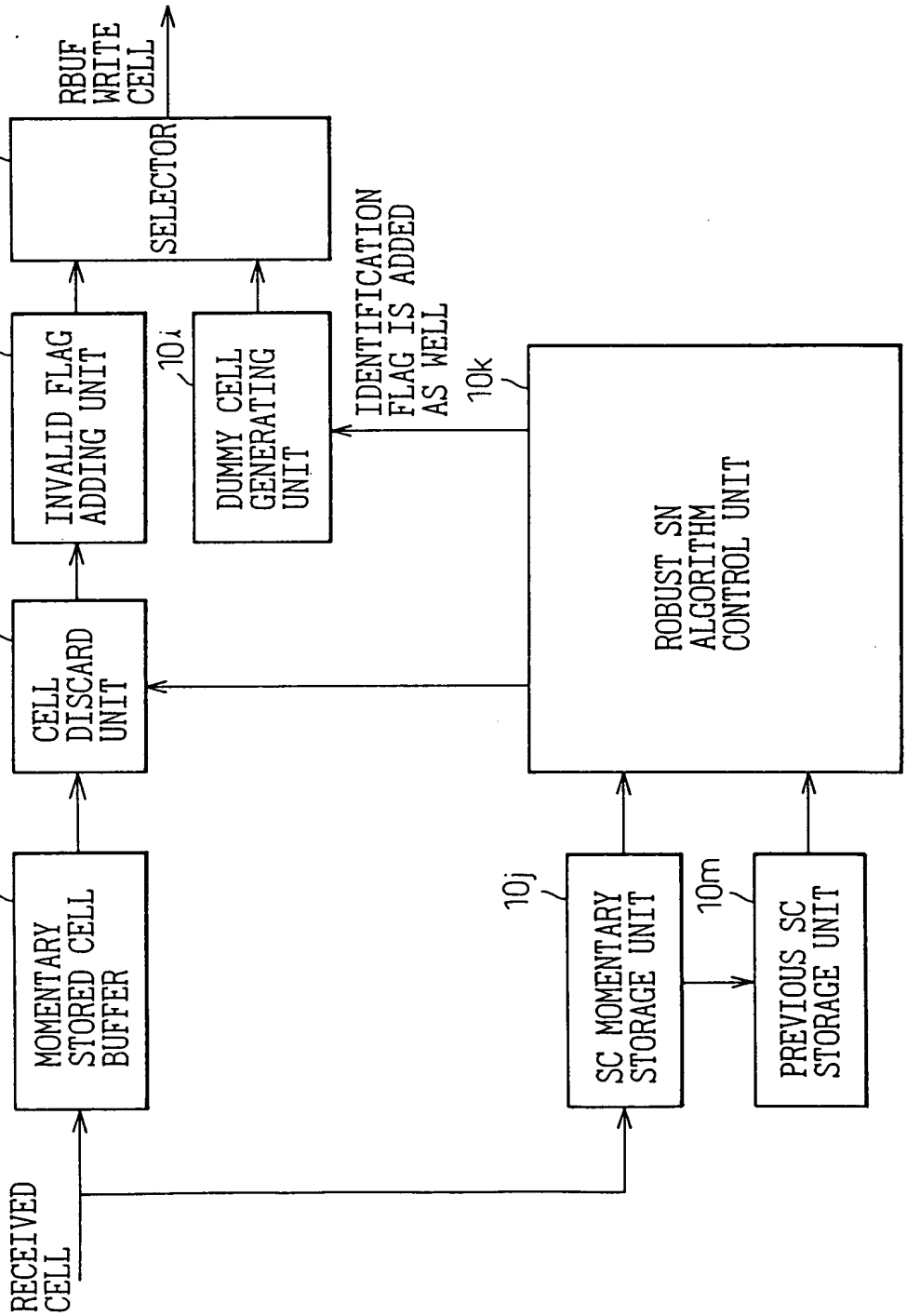
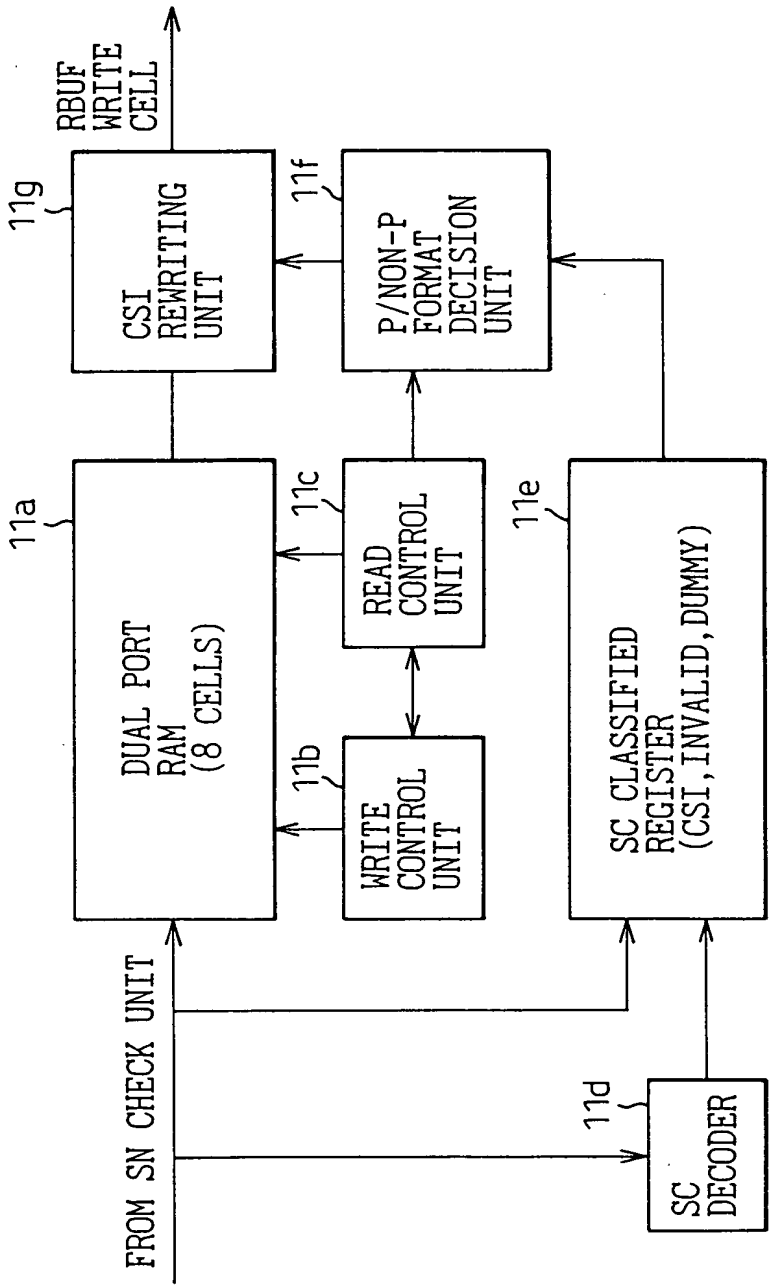

CSI
SC2-0
10d
SN CORRECTION UNIT
CORRECTION CONTROL
10c
CORRECTION/ DETECTION MODE DECISION UNIT
RESULT OF OPERATION
RESULT OF OPERATION
10a
CRC OPERATION UNIT
10b
PARITY OPERATION UNIT
CSI
SC2-0
CRC2-0
PARITY

Fig.8


RECEIVED CELL
10e
MOMENTARY STORED CELL BUFFER
10f
CELL DISCARD UNIT
10g
INVALID FLAG ADDING UNIT
10i
DUMMY CELL GENERATING UNIT
10h
SELECTOR
RBUF WRITE CELL
IDENTIFICATION FLAG IS ADDED AS WELL
10k
ROBUST SN ALGORITHM CONTROL UNIT
10j
SC MOMENTARY STORAGE UNIT
10m
PREVIOUS SC STORAGE UNIT

EP 0 674 465 A2

Fig.9



EP 0 756 396 A2

Fig.10

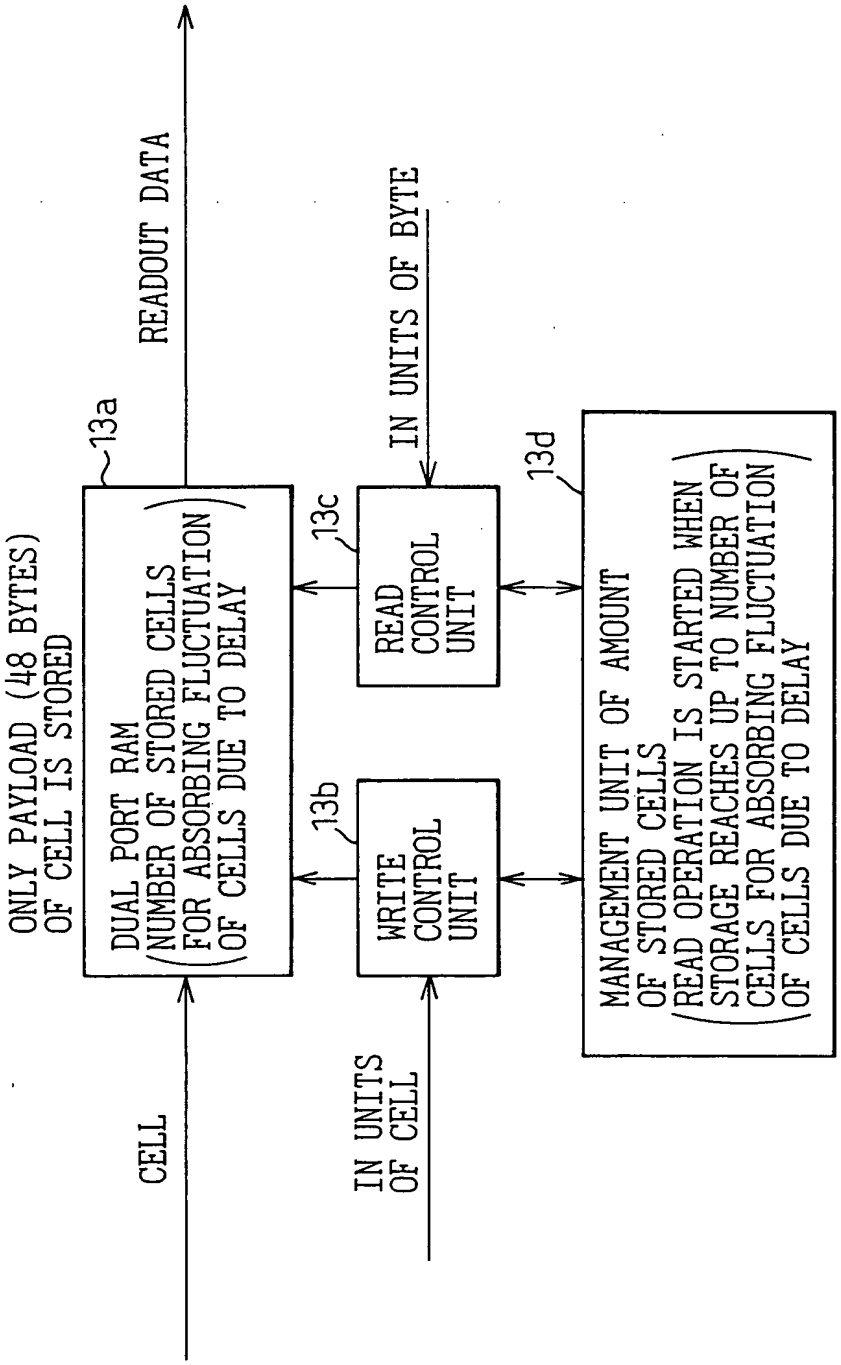


Fig.11

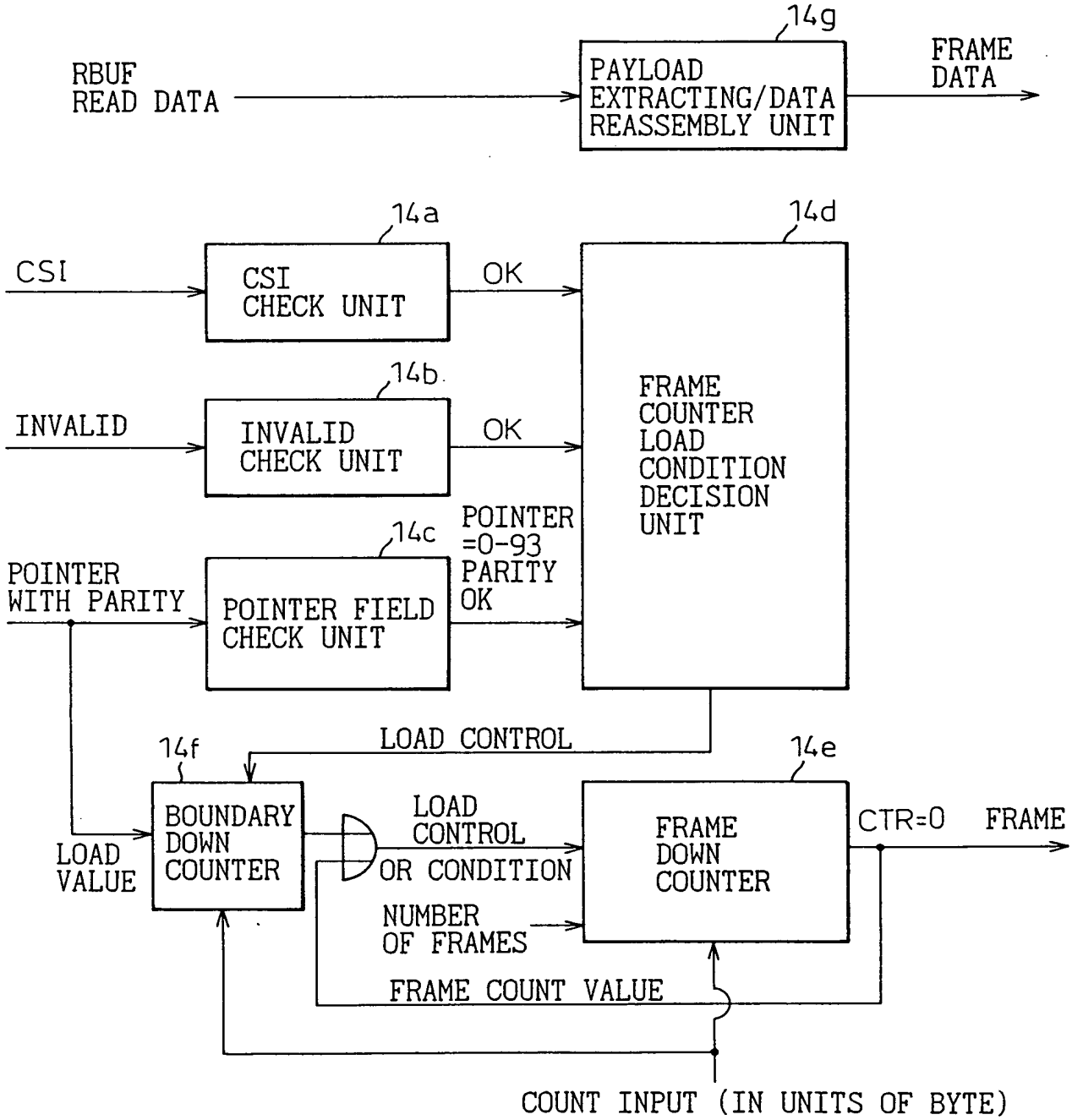

14g
RBUF
READ DATA
PAYLOAD
EXTRACTING/DATA
REASSEMBLY UNIT
FRAME
DATA
14a
14d
CSI
CSI
CHECK UNIT
OK
14b
INVALID
INVALID
CHECK UNIT
OK
FRAME
COUNTER
LOAD
CONDITION
DECISION
UNIT
POINTER
=0-93
PARITY
OK
14c
POINTER
WITH PARITY
POINTER FIELD
CHECK UNIT
LOAD CONTROL
14f
14e
BOUNDARY
DOWN
COUNTER
LOAD
CONTROL
OR CONDITION
FRAME
DOWN
COUNTER
CTR=0
FRAME
LOAD
VALUE
NUMBER
OF FRAMES
FRAME COUNT VALUE
COUNT INPUT (IN UNITS OF BYTE)

Fig.12

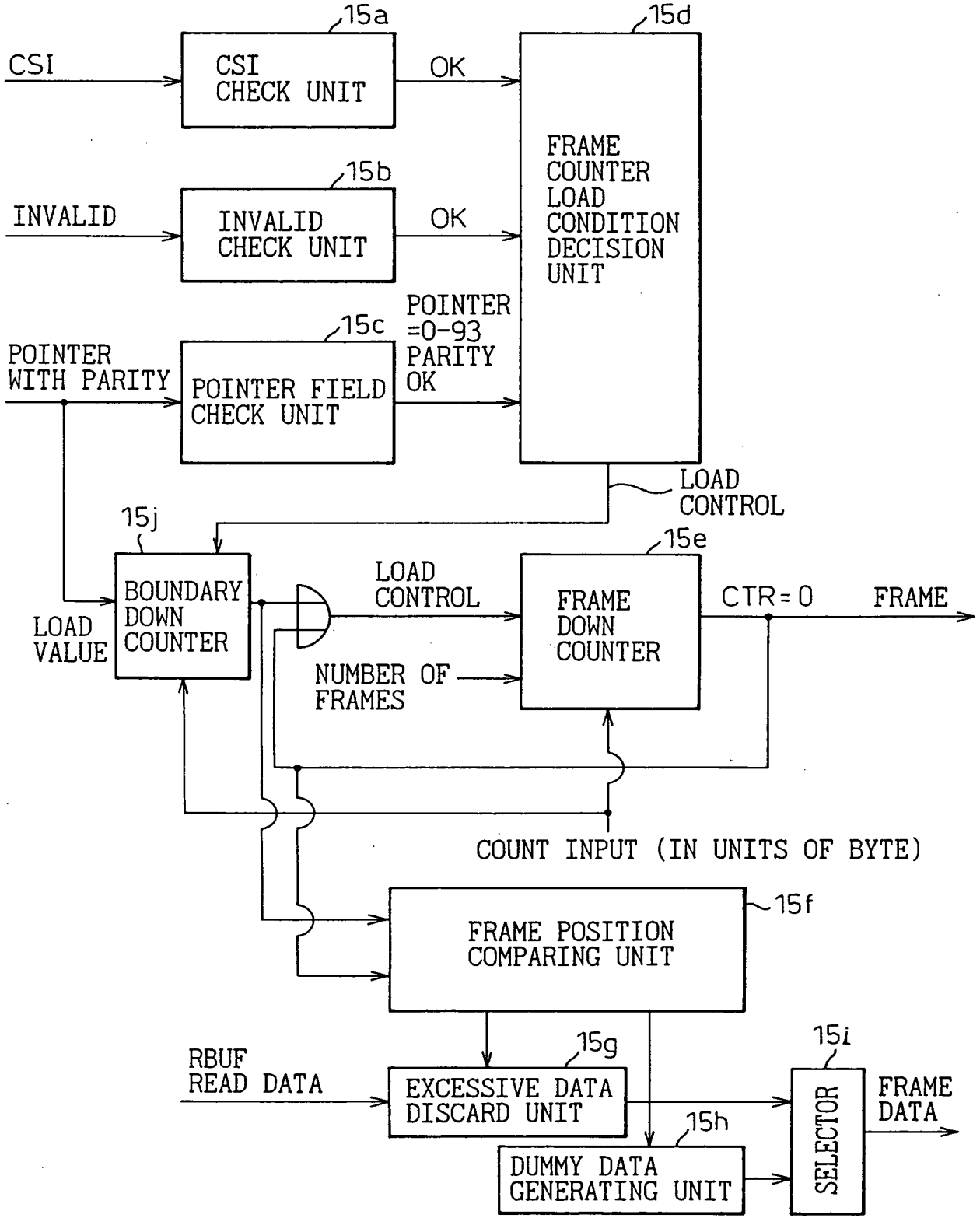

15a
CSI
CSI CHECK UNIT
OK
15d
FRAME COUNTER LOAD CONDITION DECISION UNIT
15b
INVALID
INVALID CHECK UNIT
OK
POINTER =0-93 PARITY OK
15c
POINTER WITH PARITY
POINTER FIELD CHECK UNIT
LOAD CONTROL
15j
15e
BOUNDARY DOWN COUNTER
LOAD VALUE
LOAD CONTROL
FRAME DOWN COUNTER
CTR=0
FRAME
NUMBER OF FRAMES
COUNT INPUT (IN UNITS OF BYTE)
15f
FRAME POSITION COMPARING UNIT
15g
15i
RBUF READ DATA
EXCESSIVE DATA DISCARD UNIT
SELECTOR
FRAME DATA
15h
DUMMY DATA GENERATING UNIT

Fig.13

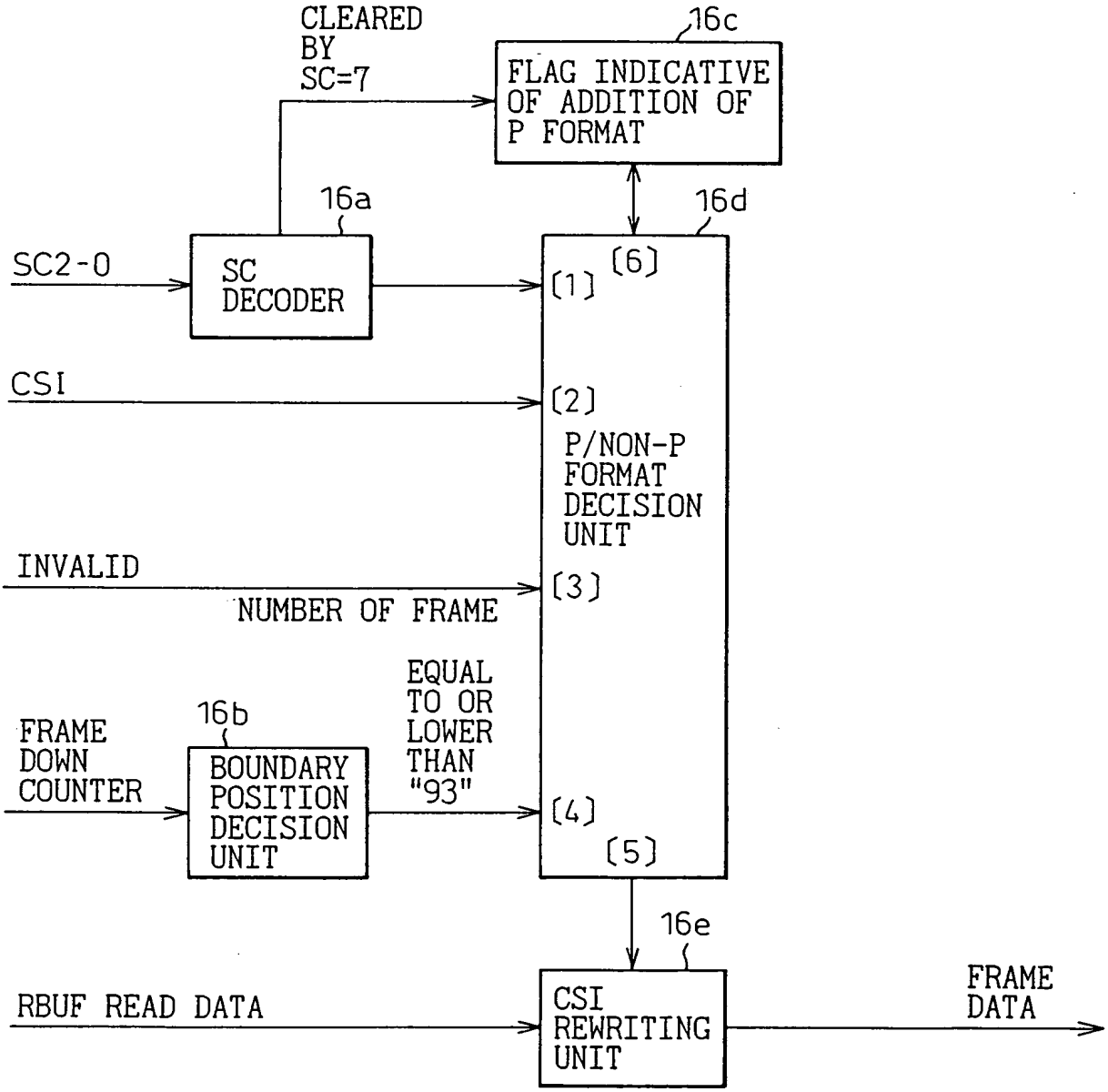

CLEARED BY SC=7
16c
FLAG INDICATIVE OF ADDITION OF P FORMAT
16a
16d
SC2-0
SC DECODER
(1)
(6)
CSI
(2)
P/NON-P FORMAT DECISION UNIT
INVALID
NUMBER OF FRAME
(3)
EQUAL TO OR LOWER THAN "93"
FRAME DOWN COUNTER
16b
BOUNDARY POSITION DECISION UNIT
(4)
(5)
16e
RBUF READ DATA
CSI REWRITING UNIT
FRAME DATA

Fig.14

SC	CSI	INVALID	FRAME COUNTER	P FORMAT HAS BEEN ADDED	DECISION PROCESSING	NOTE
0.2.4	1	0	d.c	d.c.	P FORMAT IS MAINTAINED	*1
	1	1	1	d.c.	P FORMAT IS MAINTAINED	*2
	1	1	0	d.c.	CHANGED TO NON-P FORMAT	*3
	0	0	1	d.c.	CHANGED TO P FORMAT	*4
	0	0	0	d.c.	NON-P FORMAT IS MAINTAINED	
	0	1	1	d.c.	CHANGED TO P FORMAT	*3
	0	1	0	d.c.	NON-P FORMAT IS MAINTAINED	*2
1.3.5.7.	0	0	d.c	d.c.	NON-P FORMAT IS MAINTAINED	
	1	0	d.c	d.c.	CHANGED TO NON-P FORMAT	ASSUMING AS CSI ERROR
6	d.c	d.c	d.c	0	P FORMAT IS MAINTAINED	BAND IS COMPULSORILY ADJUSTED
	1	0	d.c	1	P FORMAT IS MAINTAINED	*1
	1	1	0	1	CHANGED TO NON-P FORMAT	*3
	0	0	0	1	NON-P FORMAT IS MAINTAINED	
	0	1	0	1	NON-P FORMAT IS MAINTAINED	*2

*1 RECOGNIZED AS NORMAL POINTER
*2 ASSUMED AS MULTIPLE BIT ERROR INCLUDING CRC AND EP
*3 ASSUMED AS MULTIPLE BIT ERROR INCLUDING CSI AND EP
*4 ASSUMED AS DUMMY CELL

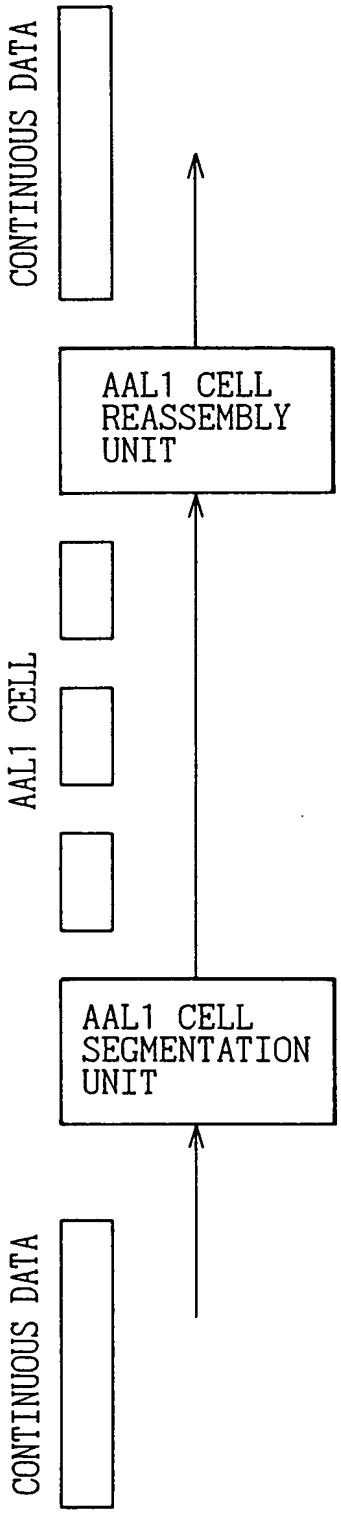

CONTINUOUS DATA
AAL1 CELL REASSEMBLY UNIT
AAL1 CELL
AAL1 CELL SEGMENTATION UNIT
CONTINUOUS DATA

Fig.15

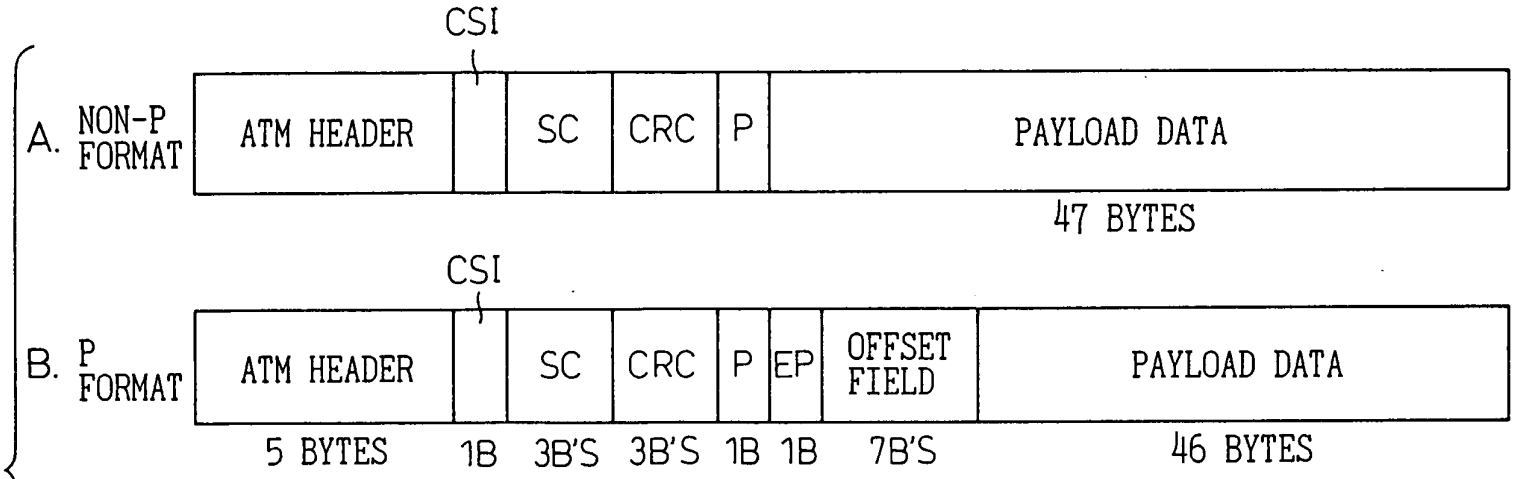
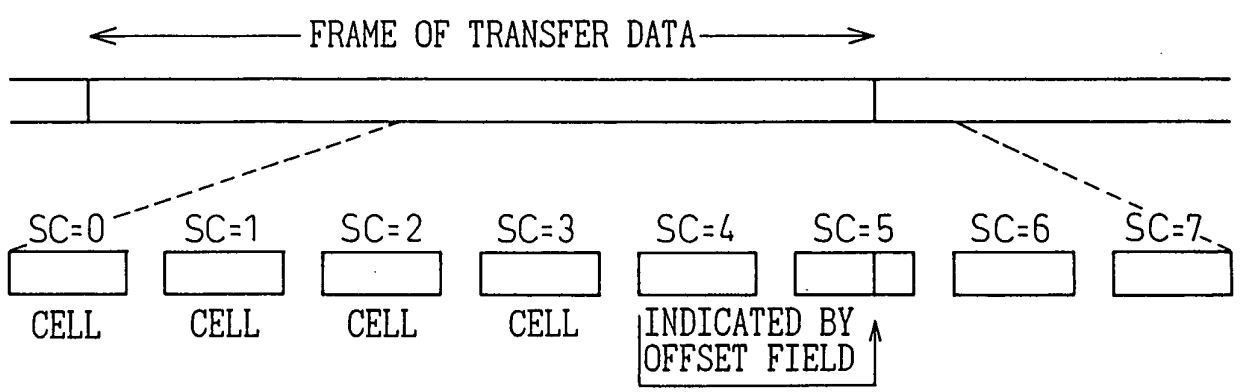


Fig.16

ATM HEADER : ATM CELL HEADER (5 BYTES)
CSI : CONVERGENCE SUBLAYER INDICATION
P/NON-P FORMAT IDENTIFIER (P FORMAT, WHEN CSI=1)
SC : SEQUENCE COUNT
NUMBERS OF 0-7 ARE INDICATED CYCLICLY (SC=0-7 PER 1 CYCLE)
CRC : CYCLIC REDUNDANCY CHECK
ERROR CHECK (CRC-3) FOR CSI AND SC AREAS
P : PARITY
EVEN PARITY INDICATION FOR CSI, SC AND CRC AREAS
EP : EVEN PARITY
EVEN PARITY INDICATION FOR OFFSET FIELD
OFFSET FIELD: INDICATING NUMBER OF BYTES UP TO FRAME (BOUNDARY)
OF DATA TRANSFERRED
PAYLOAD DATA: TRANSFER DATA

TOKYO 3276260

Fig.17



- ODD NUMBER SC IS NON-P FORMAT AT ALL TIMES.
- ONE P FORMAT EXISTS IN ONE CYCLE AT ALL TIMES.
  NUMBER OF BYTES UP TO BOUNDARY IS SET IN ITS OFFSET FIELD.
  0-93 ARE SET IN OFFSET FIELD IF IT INDICATES BOUNDARY.
- OTHER EVEN NUMBER SC IS NON-P FORMAT.
- SC=6 BECOMES P FORMAT IF THERE IS NO BOUNDARY IN ONE CYCLE
  AND 127 IS SET IN OFFSET FIELD.

Fig.18

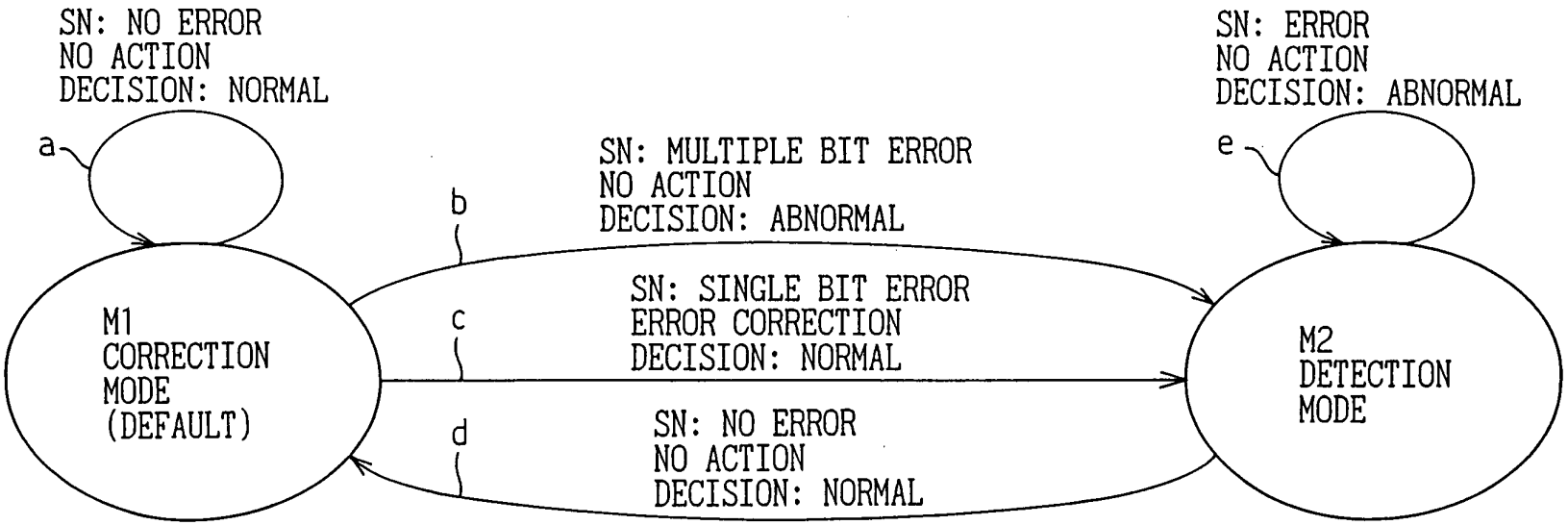

SN: NO ERROR
NO ACTION
DECISION: NORMAL
a
M1
CORRECTION
MODE
(DEFAULT)
b
SN: MULTIPLE BIT ERROR
NO ACTION
DECISION: ABNORMAL
c
SN: SINGLE BIT ERROR
ERROR CORRECTION
DECISION: NORMAL
d
SN: NO ERROR
NO ACTION
DECISION: NORMAL
SN: ERROR
NO ACTION
DECISION: ABNORMAL
e
M2
DETECTION
MODE

Fig.19

	RESULT OF CRC-3 OPERATION	RESULT OF PARITY CHECK	STATE	MODE TRANSITION
DURING CORRECTION MODE	OK	OK	SN IS VALID	
	NG	NG	1 BIT IS CORRECTED BY CRC-3 ERROR BIT DECISION AND SN IS VALID	TRANSITION TO DETECTION MODE
	OK	NG	CORRECTION BY PARITY BIT IS DONE AND SN IS VALID	TRANSITION TO DETECTION MODE
	NG	OK	CORRECTION CANNOT BE DONE DUE TO MULTIPLE BIT ERROR AND SN IS INVALID	TRANSITION TO DETECTION MODE
DURING DETECTION MODE	OK	OK	SN IS VALID	TRANSITION TO CORRECTION MODE
	NG	NG	NOT CORRECTED AND SN IS INVALID	
	OK	NG	NOT CORRECTED AND SN IS INVALID	
	NG	OK	NOT CORRECTED AND SN IS INVALID	

FOETTO 9270S260

Fig.20

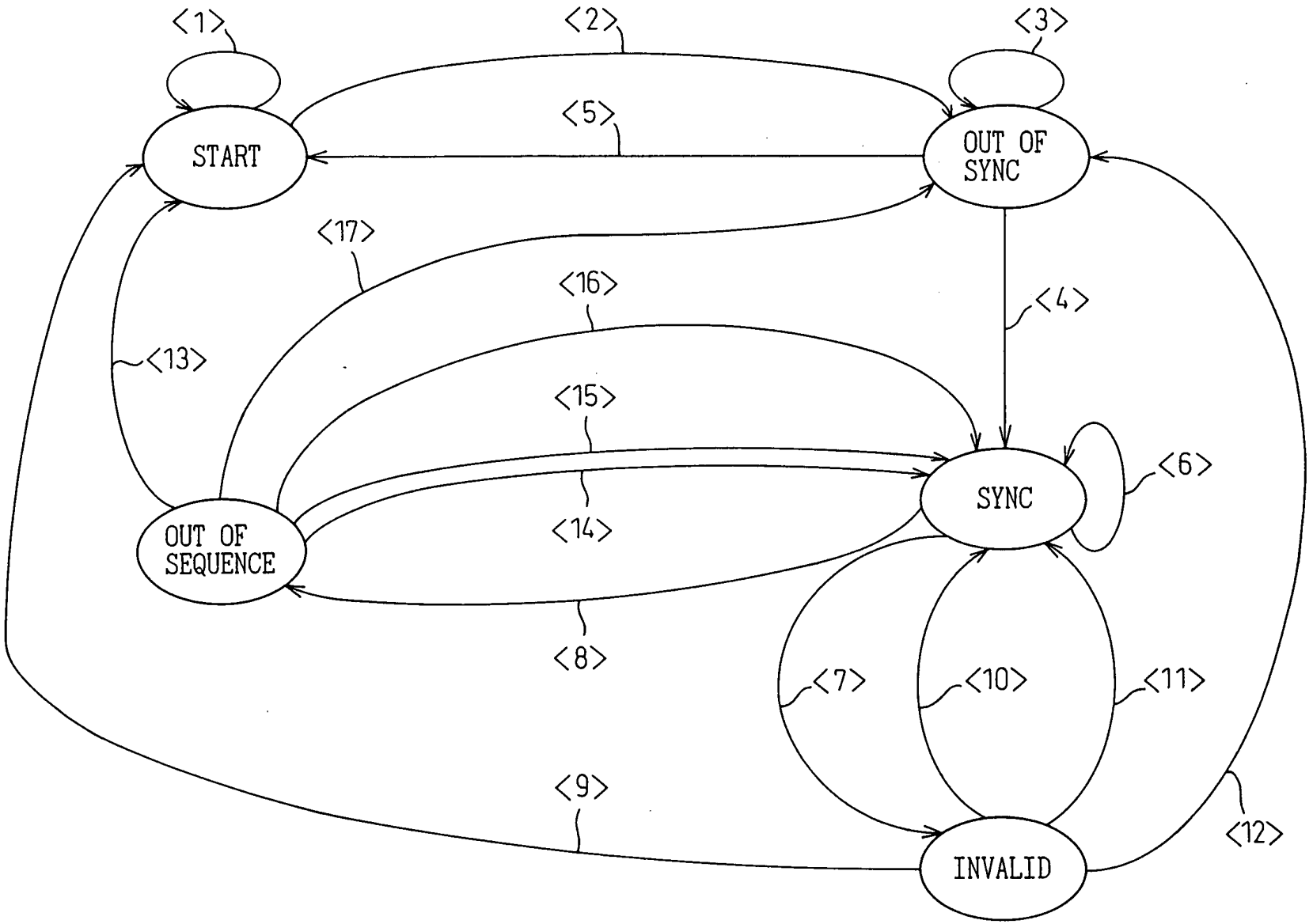
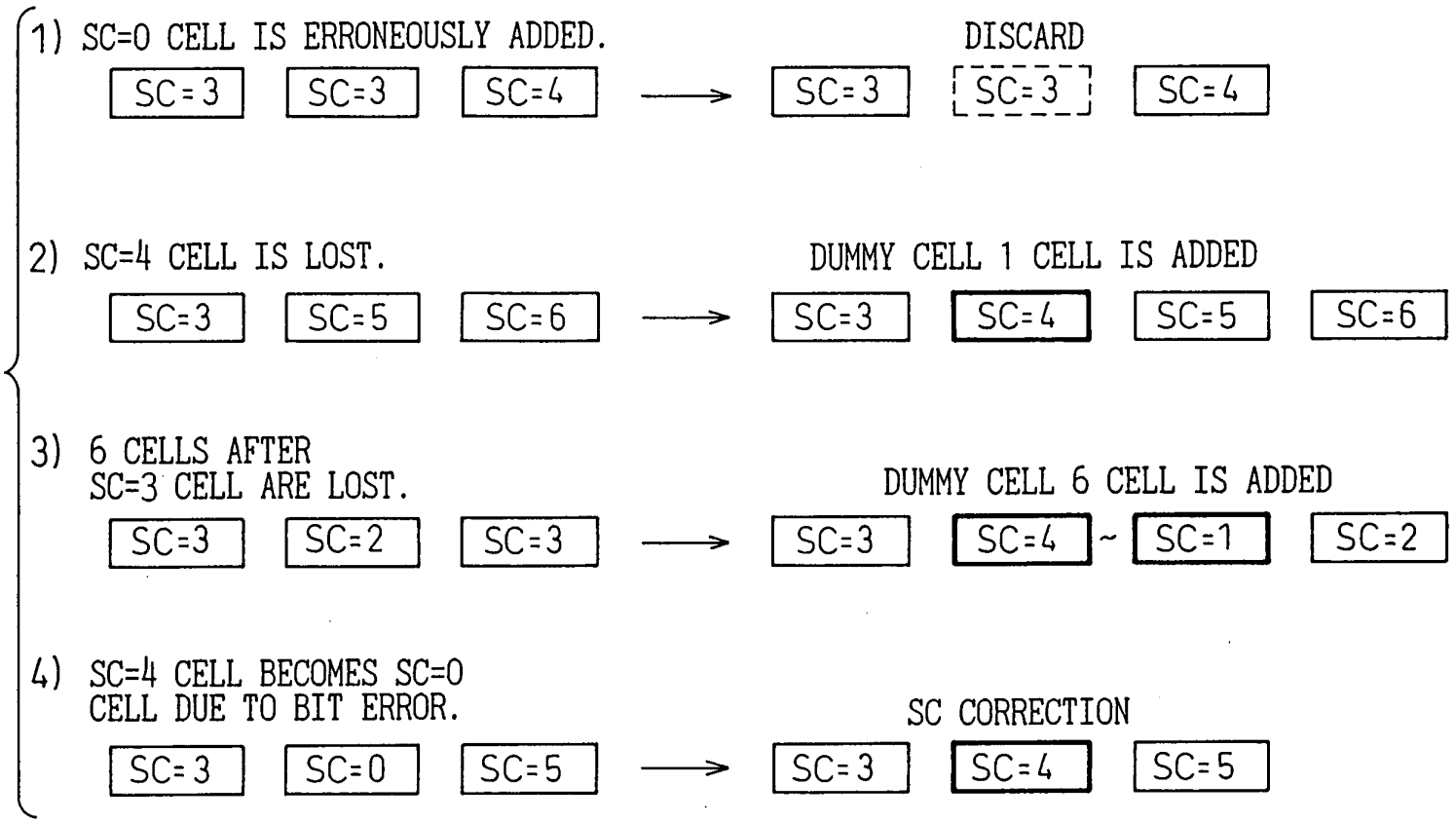


Fig.21


1) SC=0 CELL IS ERRONEOUSLY ADDED.
SC=3
SC=3
SC=4
DISCARD
SC=3
SC=3
SC=4
2) SC=4 CELL IS LOST.
SC=3
SC=5
SC=6
DUMMY CELL 1 CELL IS ADDED
SC=3
SC=4
SC=5
SC=6
3) 6 CELLS AFTER
SC=3 CELL ARE LOST.
SC=3
SC=2
SC=3
DUMMY CELL 6 CELL IS ADDED
SC=3
SC=4
~
SC=1
SC=2
4) SC=4 CELL BECOMES SC=0
CELL DUE TO BIT ERROR.
SC=3
SC=0
SC=5
SC CORRECTION
SC=3
SC=4
SC=5